Figure 1 – Terrain Elevation Data for
Albuquerque WSR-88D Radar

BEAM TOP

MINIMUM VIEWABLE ELEVATION

[13]

BEAM BOTTOM ELEVATION

[10]

TERRAIN ELEVATION

[11]

[12]

MAX ELEVATION OF INTEREST

[14]

b

a

ELEVATION (FT)

70000
60000
50000
40000
30000
20000
10000
0

0   100   200   300   400   500

RANGE (KM)
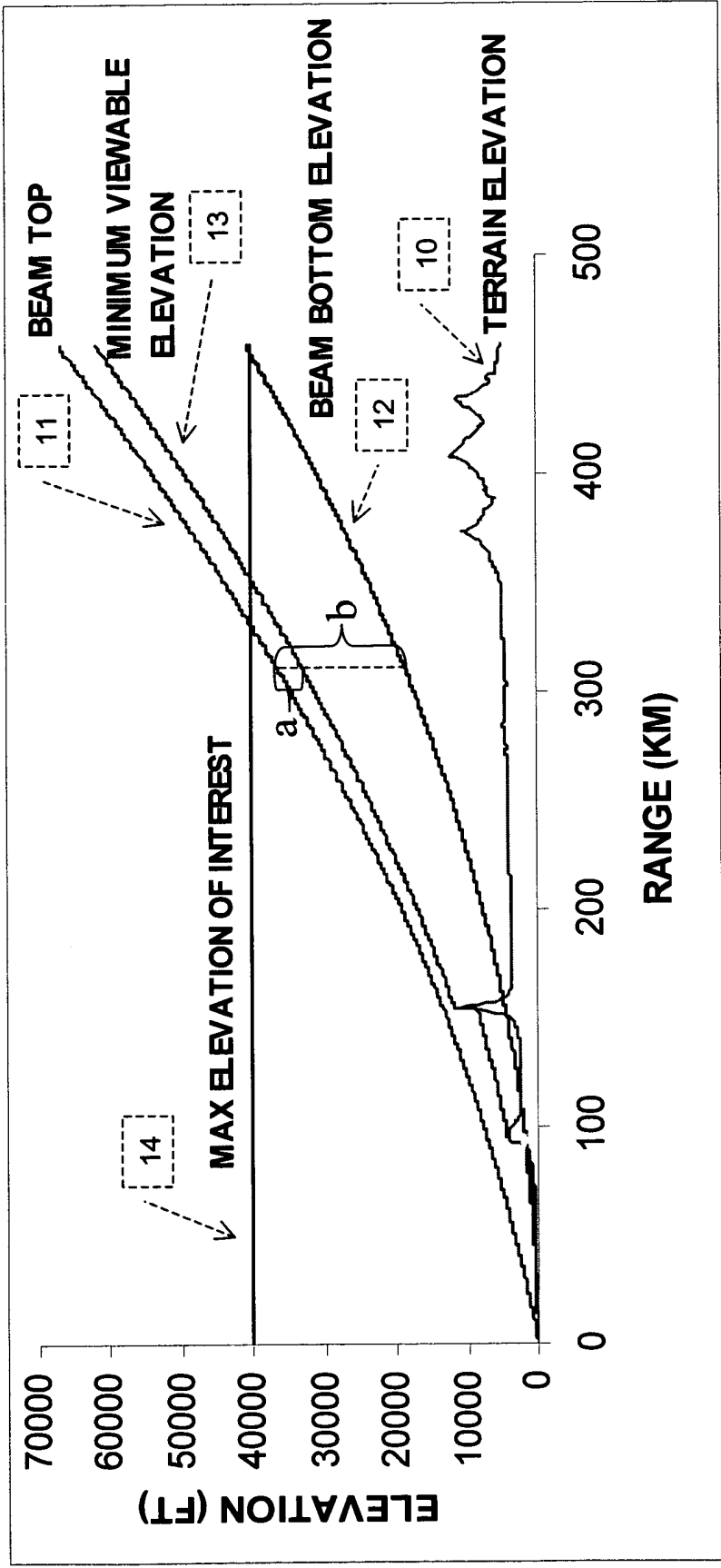
Radar Coverage = (a/b) * 100%
Radar Blockage = (1 – a/b) * 100%

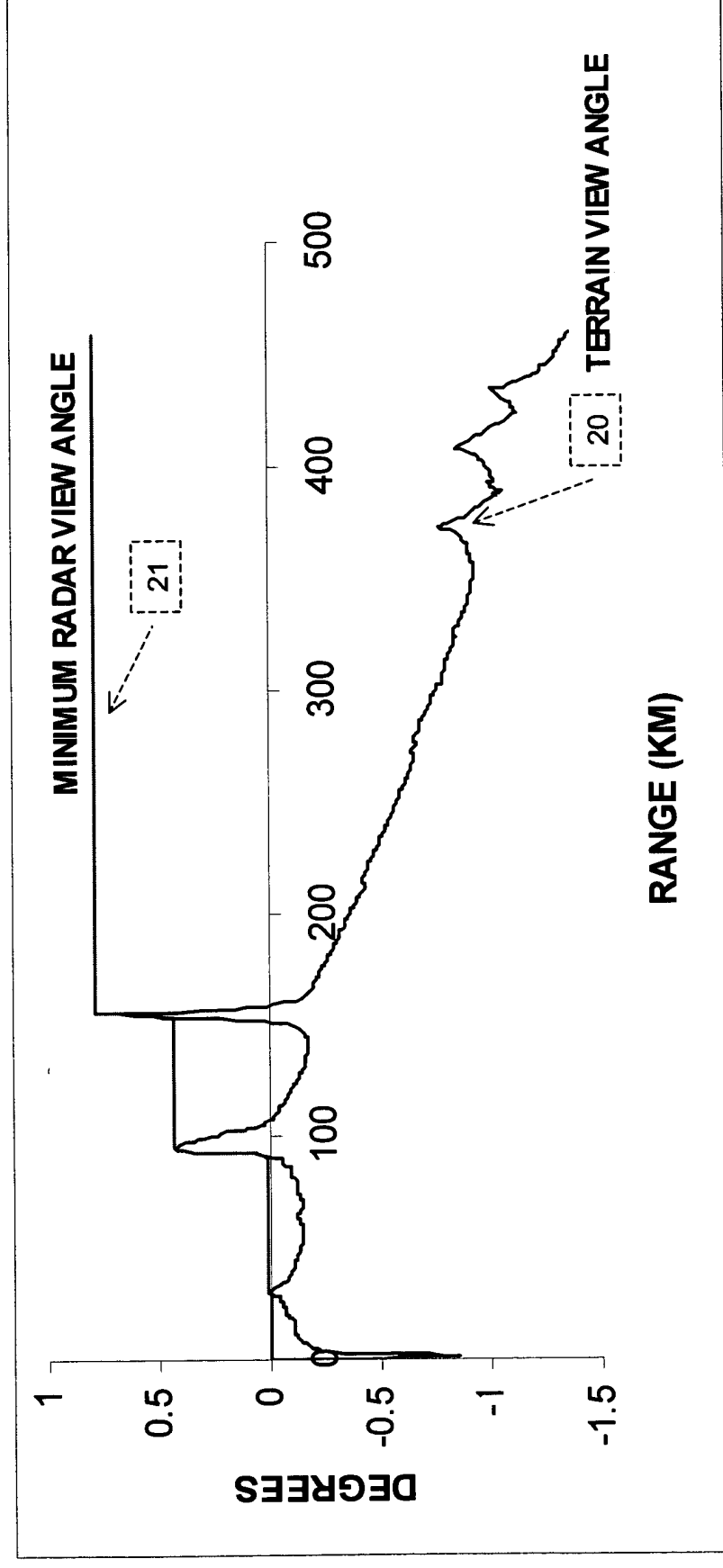Figure 2 – Radar Coverage Map Model for Single Tilt Radar Products
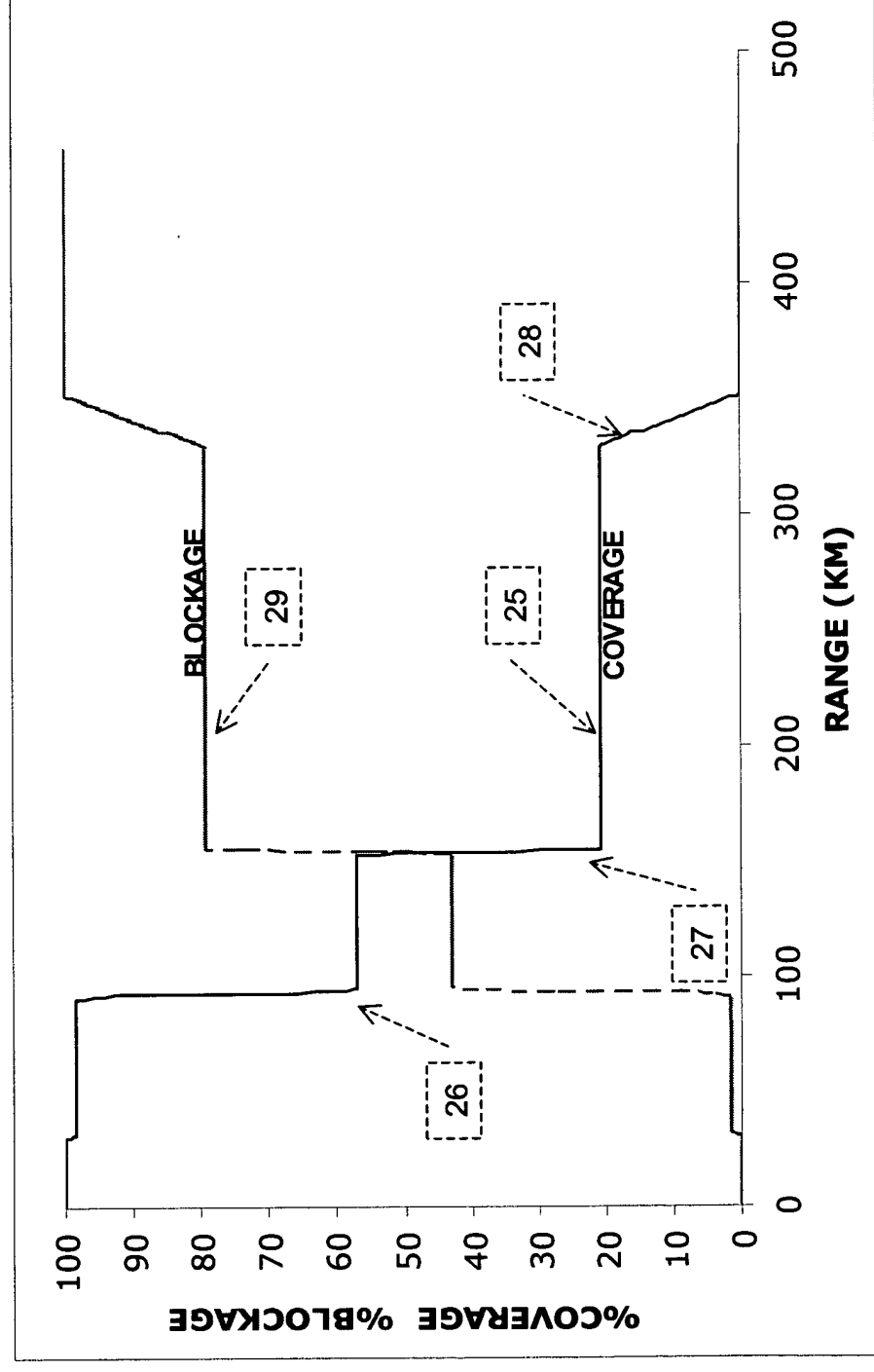
Figure 3 – Minimum Radar View Angle

Figure 4 – Example of Radial Radar Coverage and Blockage Profiles for a Single Tilt Radar Product
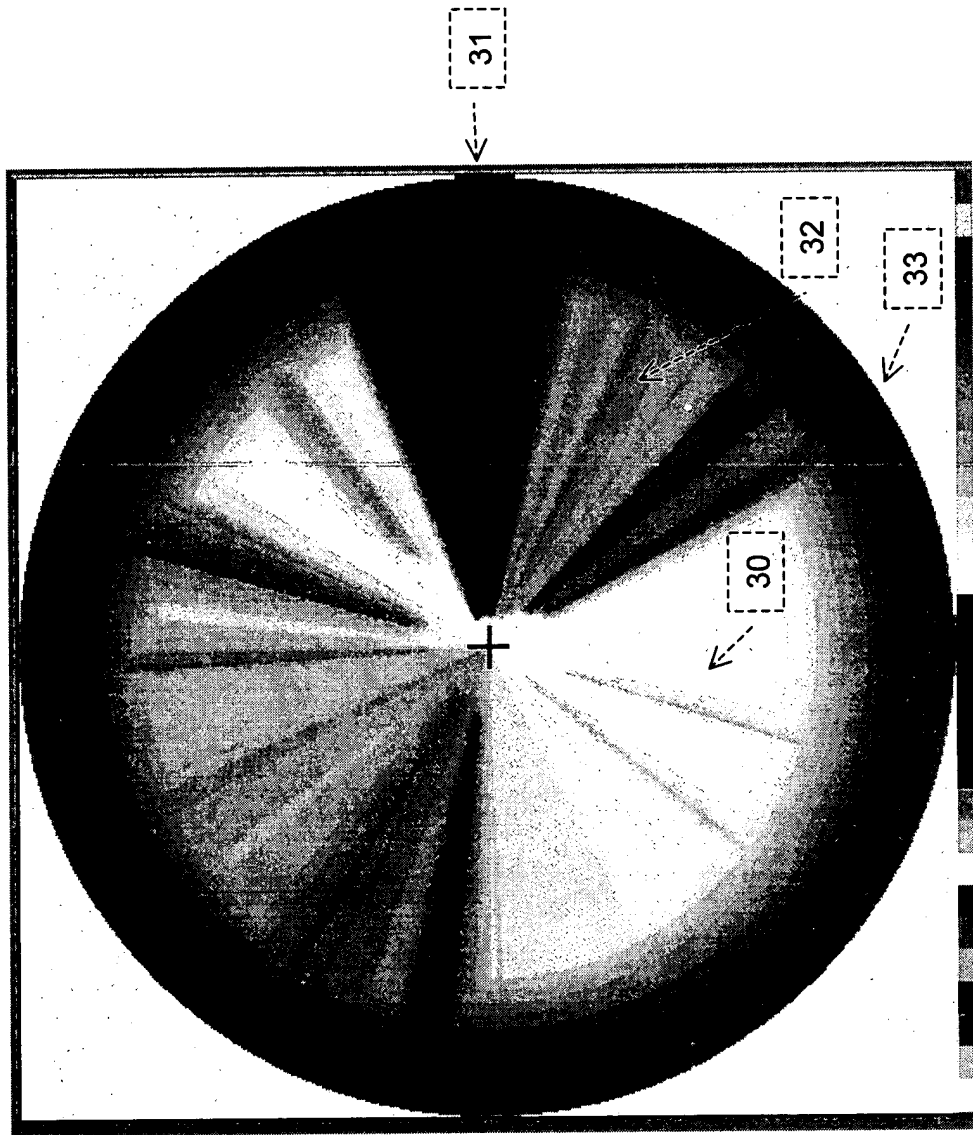
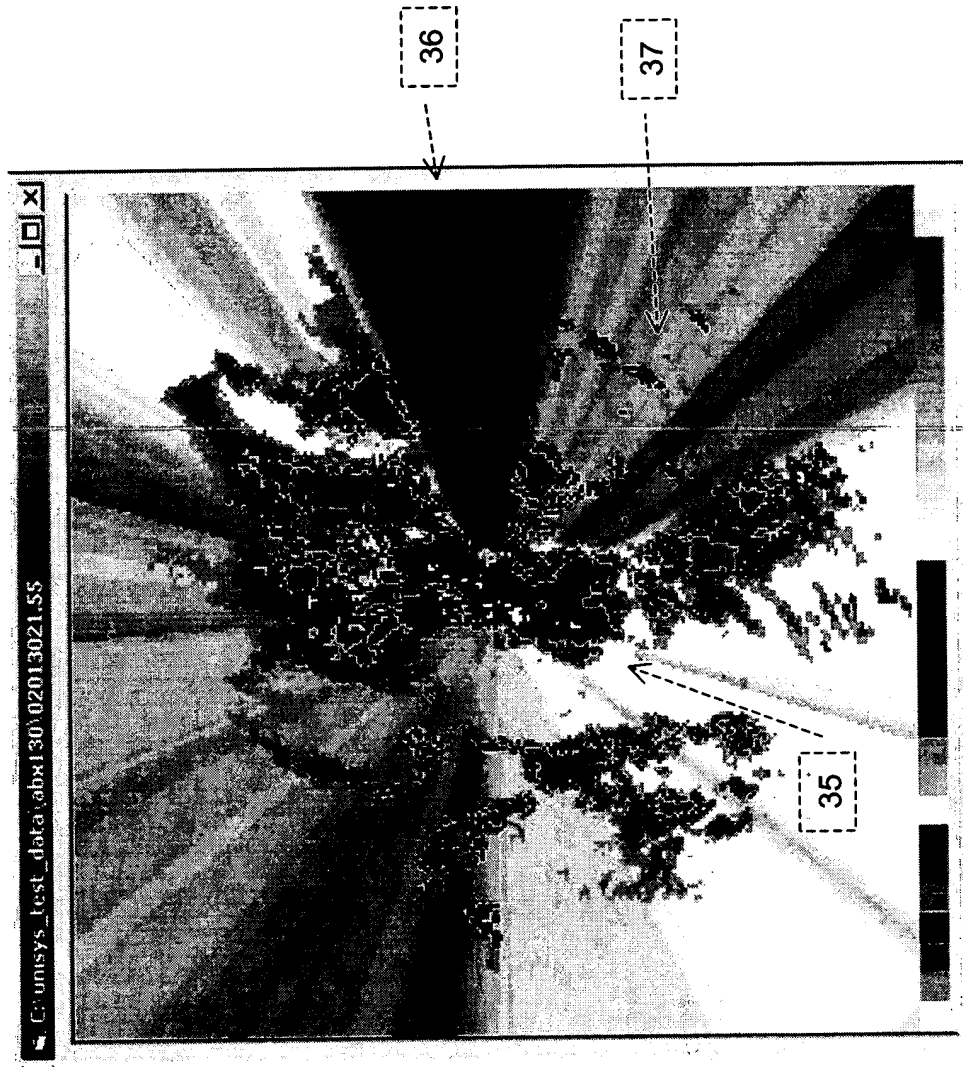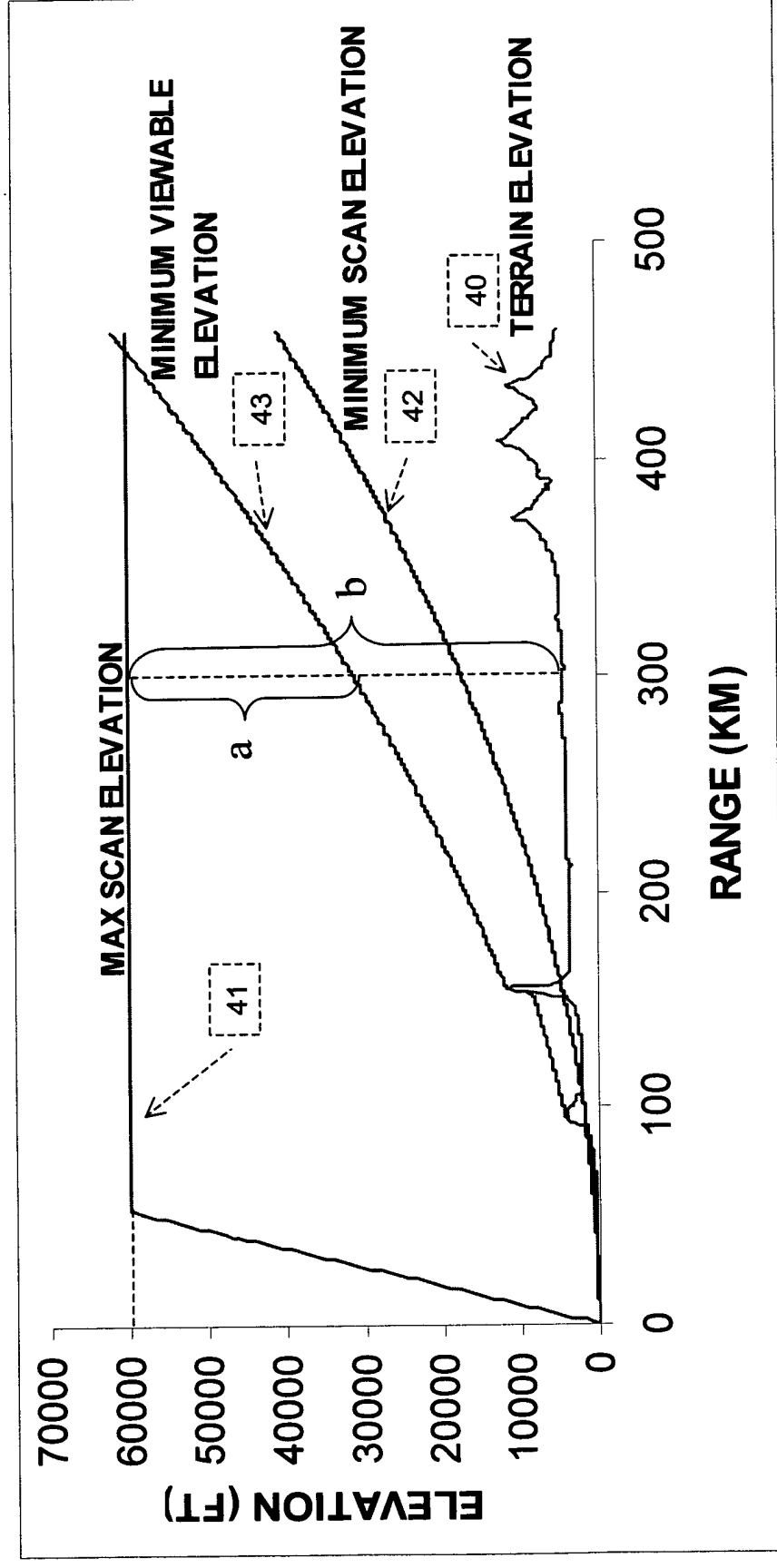Figure 5 – Tilt 1 Radar Coverage Map for Albuquerque WSR-88D radar

Figure 6 – Tilt 1 Reflectivity Product Overlaid on
Albuquerque Radar Coverage Map

MAX SCAN ELEVATION

MINIMUM VIEWABLE ELEVATION

MINIMUM SCAN ELEVATION

TERRAIN ELEVATION

41

43

42

40

a

b

RANGE (KM)

ELEVATION (FT)

Radar Coverage = (a/b) * 100%
Radar Blockage = (1 − a/b) * 100%

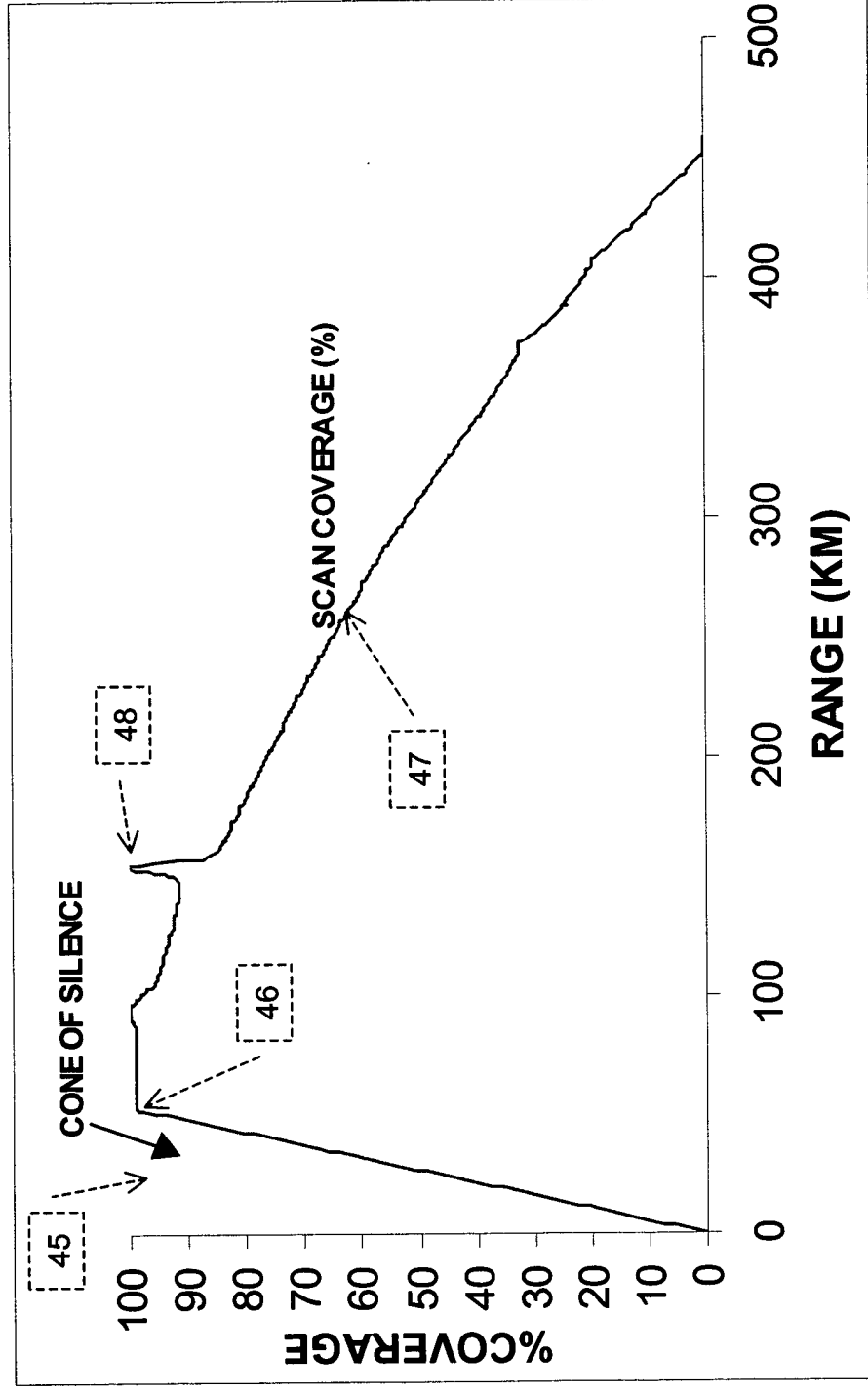Figure 7 - Radar Coverage Map Model for Layer Radar Products

Figure 8 - Example of a Radial Radar Coverage Profile for a Layer Radar Product
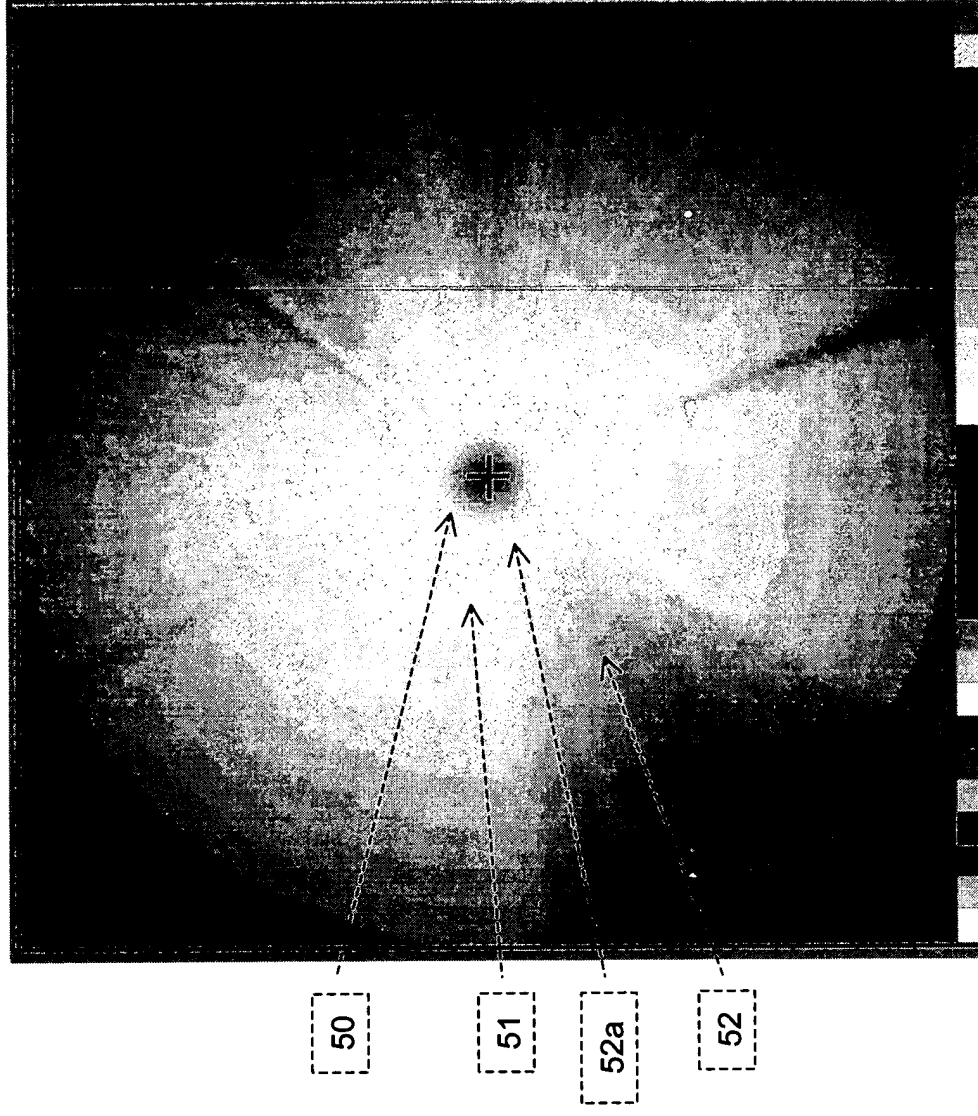
Figure 9 - Radar Coverage Map for Composite Reflectivity Product for Seattle WSR-88D radar
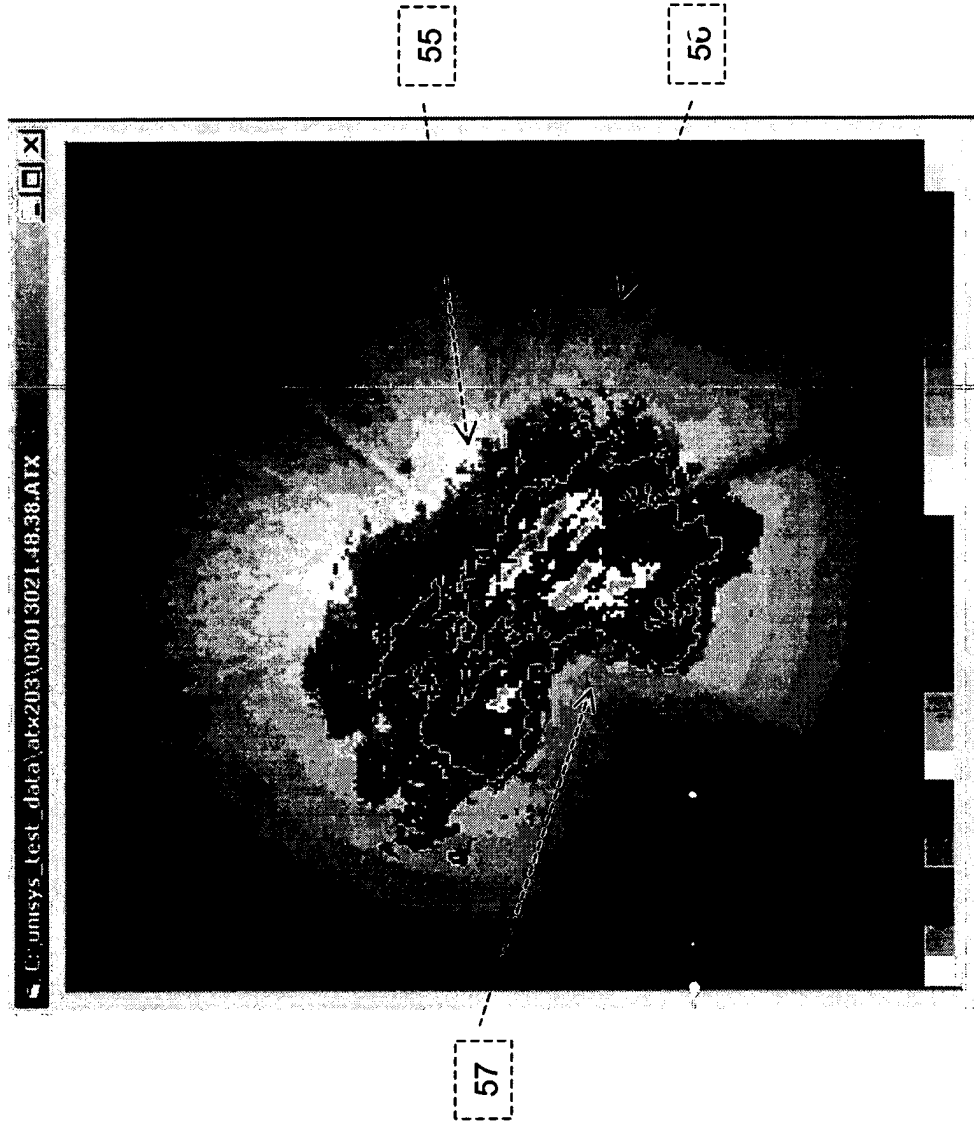
Figure 10 – Composite Reflectivity Product
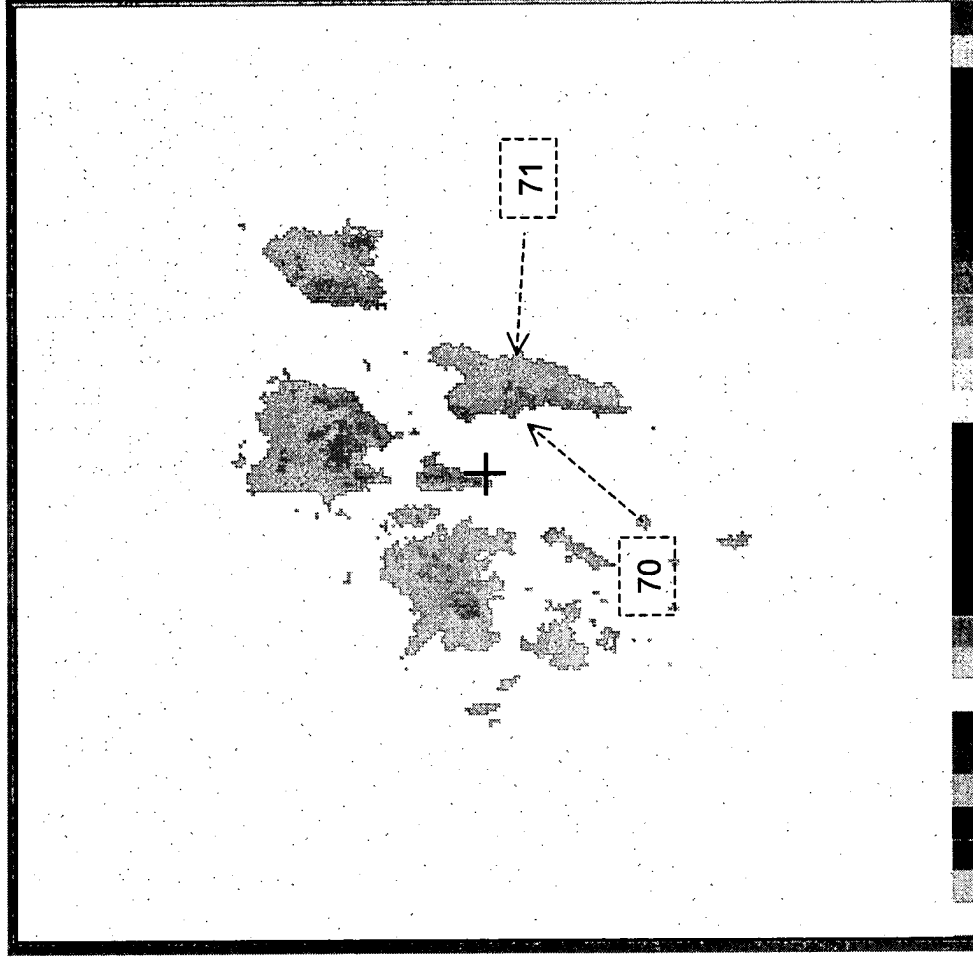Overlaid on Seattle Radar Coverage Map

Figure 13 - Radar Clutter Region Map for Albuquerque WSR-88D radar
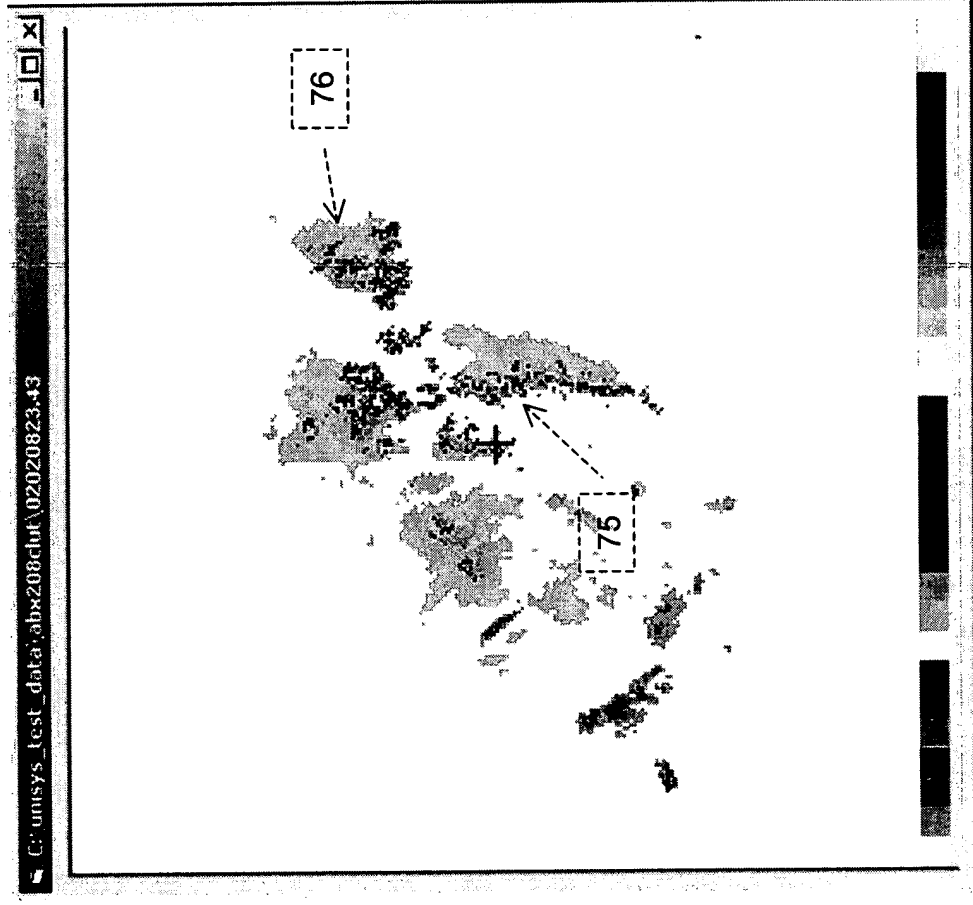
Figure 14 - Reflectivity Product Overlaid on
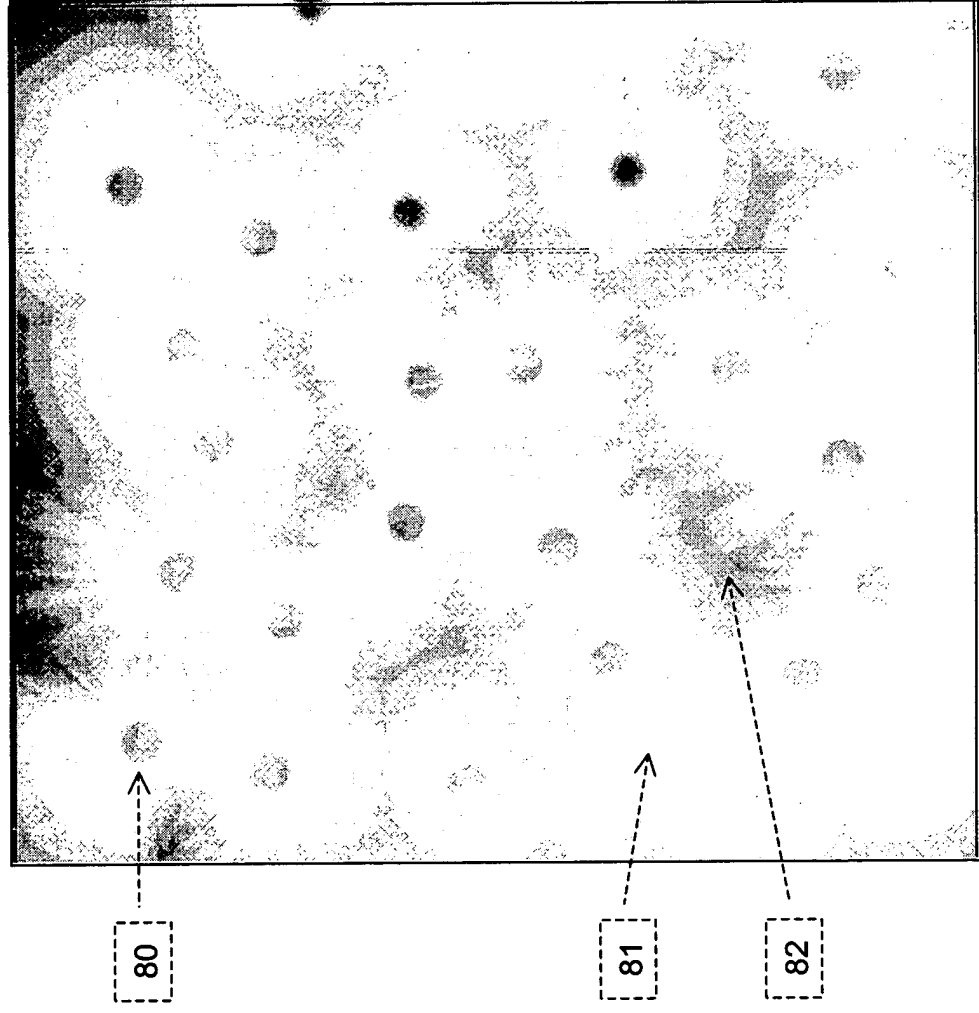Albuquerque Radar Clutter Region Map

Figure 15 – Radar Coverage Map for Composite Reflectivity Mosaic Product for NW CONUS WSR-88D Radars
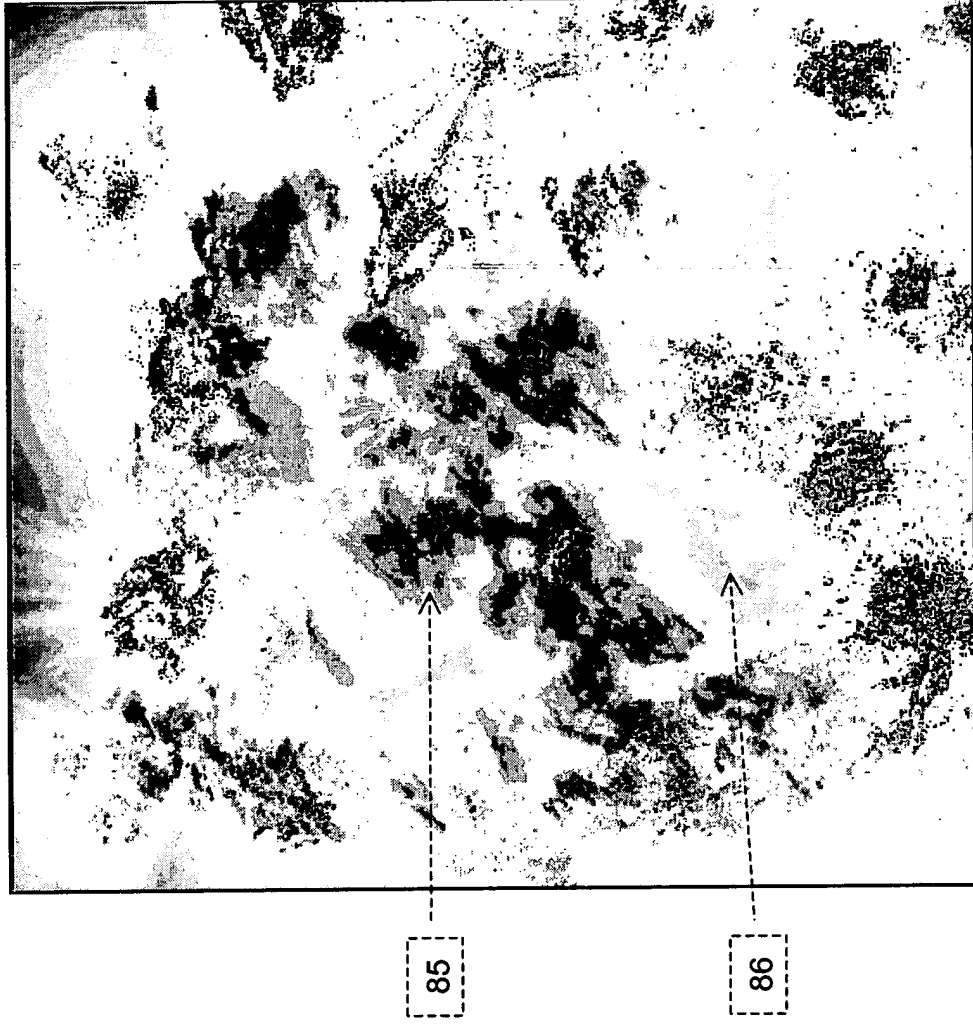
Figure 16 – Composite Reflectivity Mosaic Product Overlaid on NW CONUS Radar Coverage Map
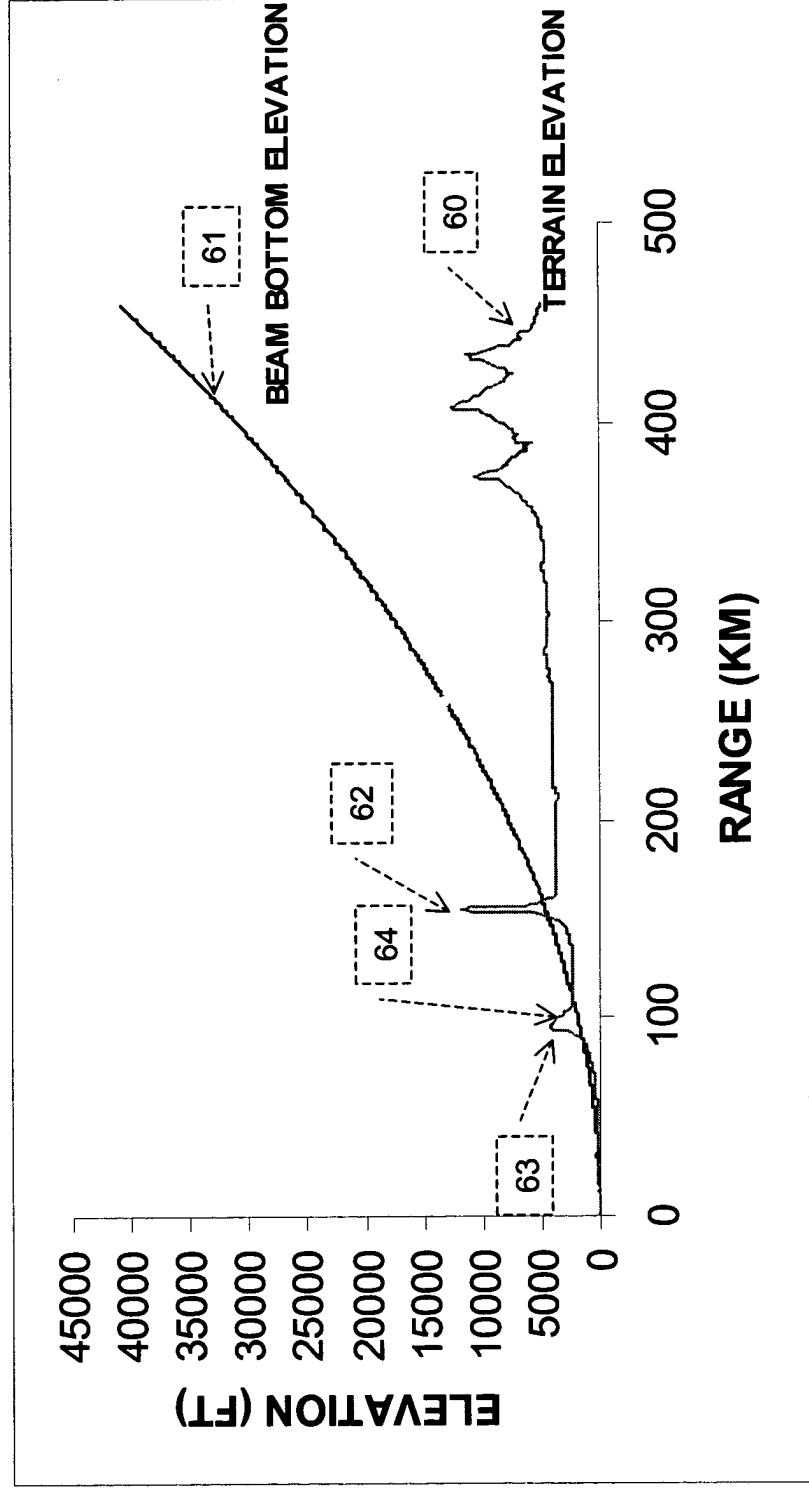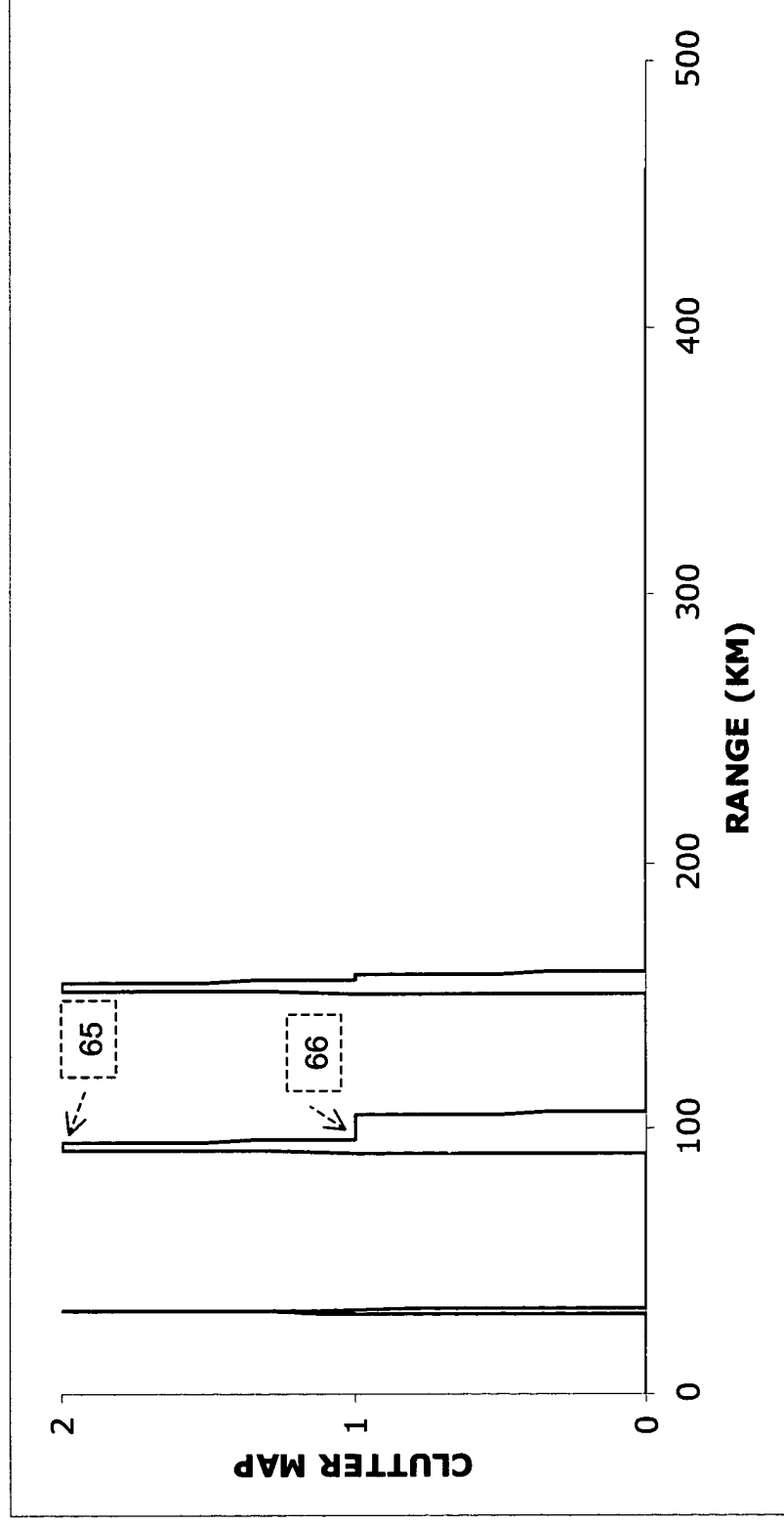
85

86

Figure 11 - Radar Clutter Region Map Model

Figure 12 - Example of a Radial Clutter Profile
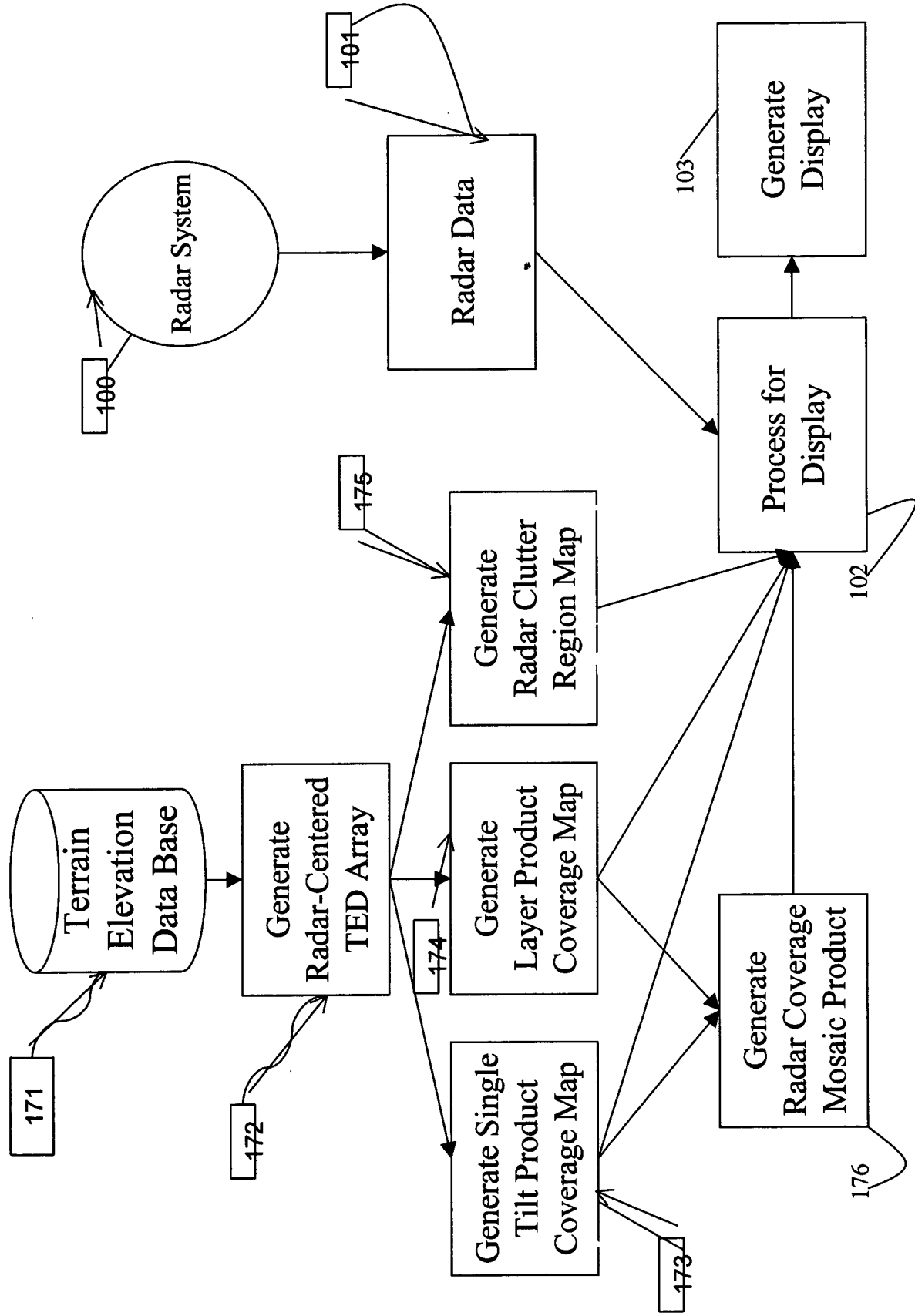
Figure 17 – Algorithmic Process Relationships

Initialize TED Array — 1.3

Iterate Steps 1.5-1.9 for each Terrain Grid Point — 1.4

Terrain Elevation Data Base — 1.1

Get Data for Next Elevation Grid Point — 1.5

Compute Az/Rng With Respect to Radar Lat/Long — 1.6

Convert Az/Rng to TED Array Coordinates — 1.7

Compute TED Array Az Span For Grid Point — 1.8

Update TED Array Bins — 1.9

TED Array — 1.2
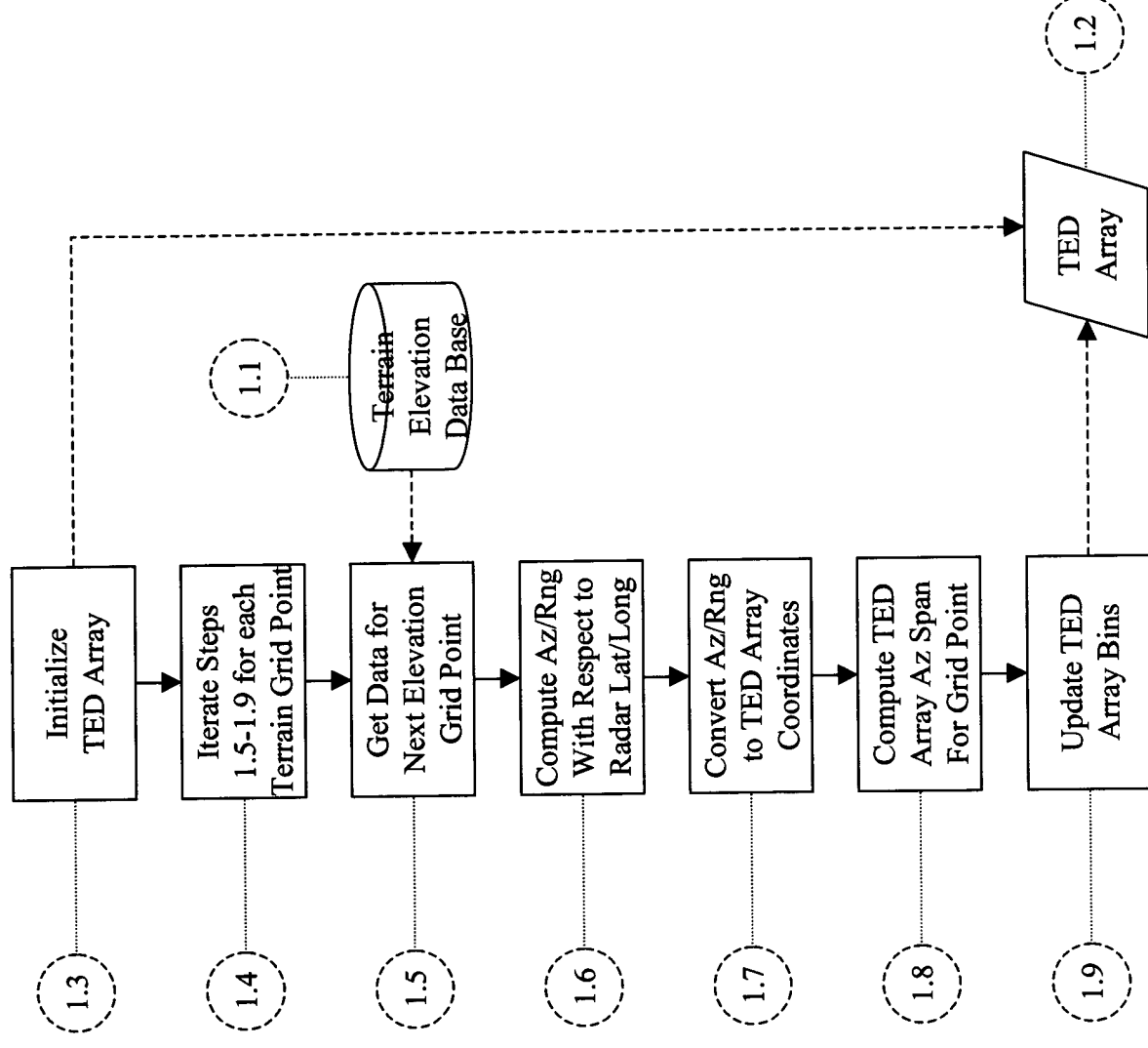
Figure 18 – Flow Diagram for Generate Maximum Terrain Elevation Data Array Algorithm

Figure 19 – Example of Maximum Terrain
Elevation Data (TED) Array

TED Array B for Grid Point Updat

RNG Index

		52	53	54	55	56	

AZ Index: 2304, 2305, 2306, 2307, 2308, 2309, 2310

Values: 146 / 146 146 / 121 120 / 105 / 106

TED Array Aft r Grid Point Updat

RNG Index

		52	53	54	55	56	

AZ Index: 2304, 2305, 2306, 2307, 2308, 2309, 2310

Values: 146 / 146 146 / 133 133 133 / 106

Terrain Data Base Grid Point Spacing: 90 meters
Terrain Data Base Grid Point Value: 133 feet

Grid Point Range/Azimuth coordinates with respect to radar:
Range = 108.673 km
Azimuth = 23.0734 degrees

TED Array coordinates:
RNG Index = (int) 108.673/2.0 = 54
AZ Index = (int) 23.0734 /0.01 = 2307
AZ_SPAN = (Roundup) (180 / π) * (0.09 / 108.673) / 0.01 = 5

Figure 20 – Mapping of Terrain Data Base Grid Point
into TED Array

Compute Beam
Edge Elevations — 2.1

Iterate Steps
2.4-2.5 for each
RC Az Sector — 2.3

Initialize
Minimum Radar
View Angle — 2.4

Iterate Steps
2.6-2.8 for each
Range Bin — 2.5

Compute
Min. Viewable
Elevation — 2.6

TED Array — 1.2

Compute
Radar Coverage
for Bin — 2.7

RC Array — 2.2

Update
Minimum Radar
View Angle — 2.8

Generate Radar
Product Radar
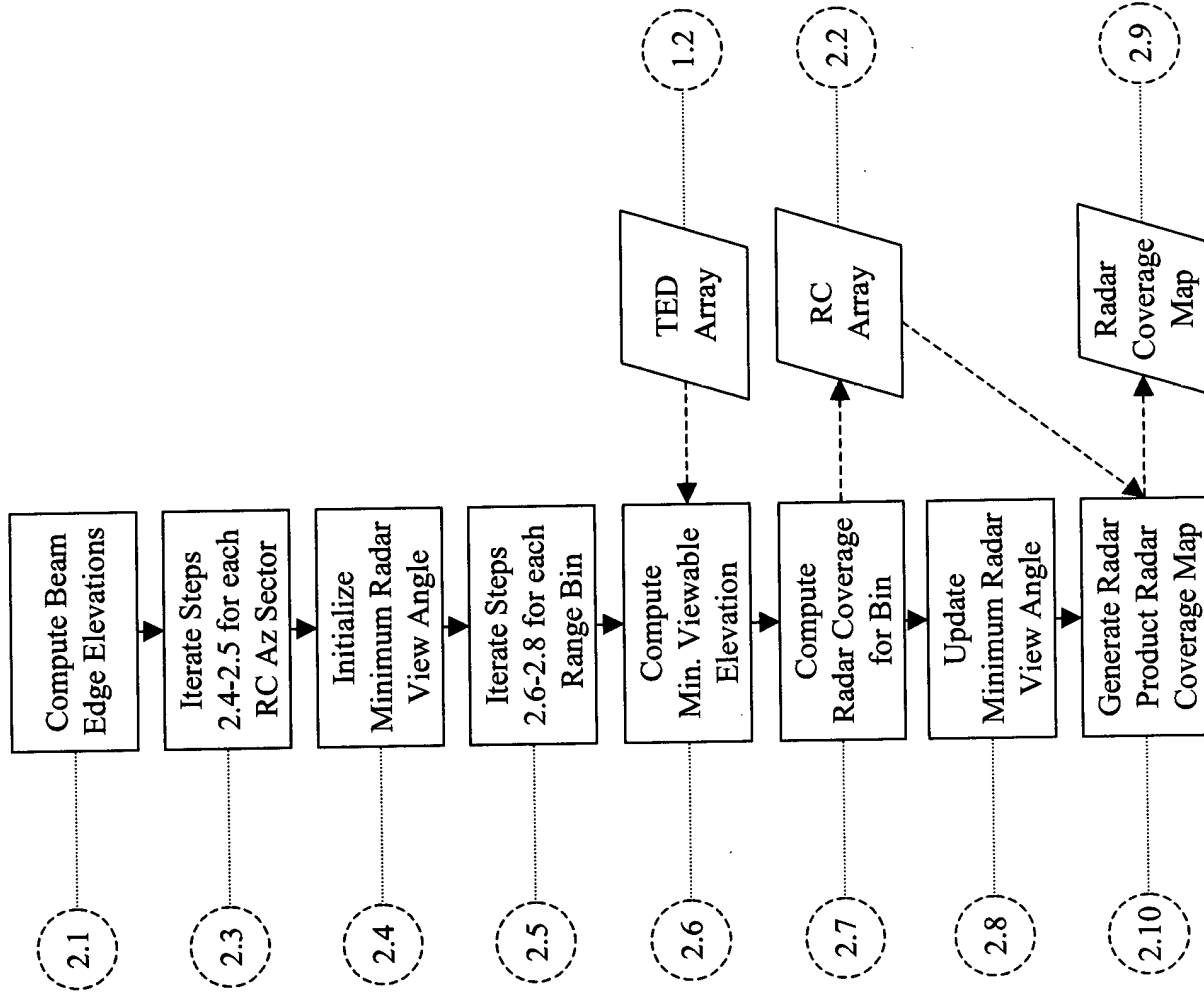Coverage Map — 2.10

Radar Coverage Map — 2.9

Figure 21 – Flow Diagram for Generate Radar Coverage
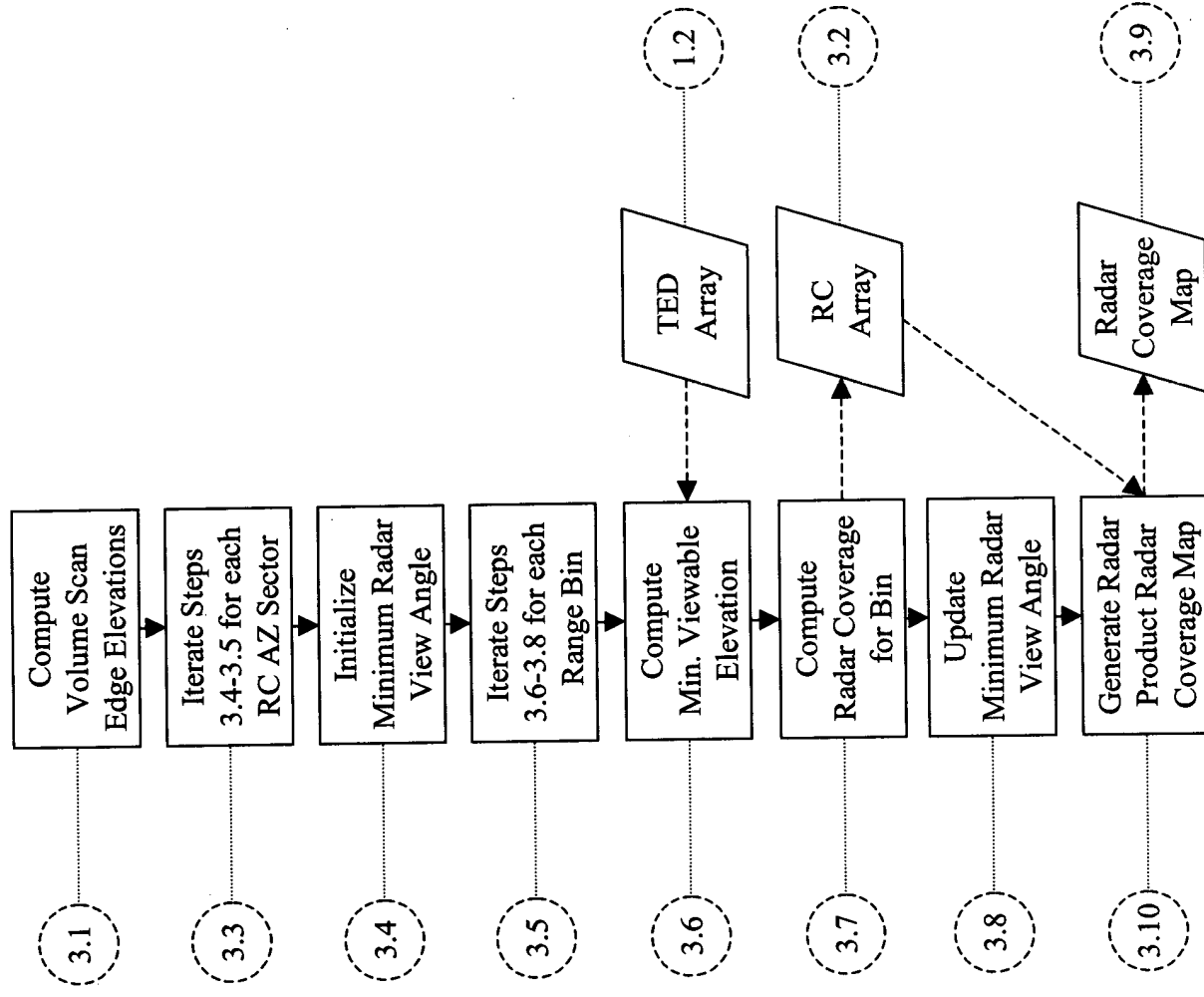Map for Single Tilt Radar Product Algorithm

Figure 22 – Flow Diagram for Generate Radar Coverage Map for Layer Radar Product Algorithm
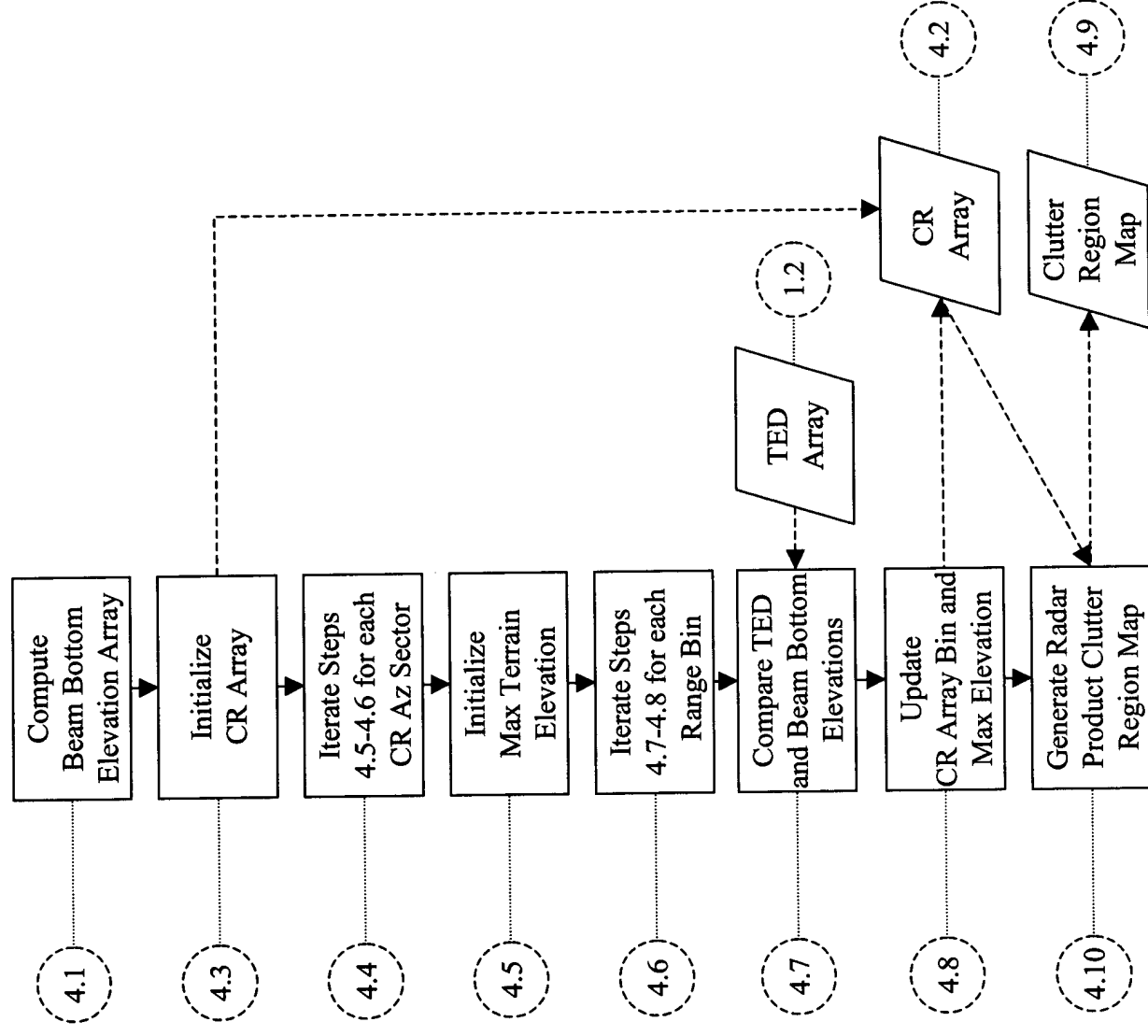
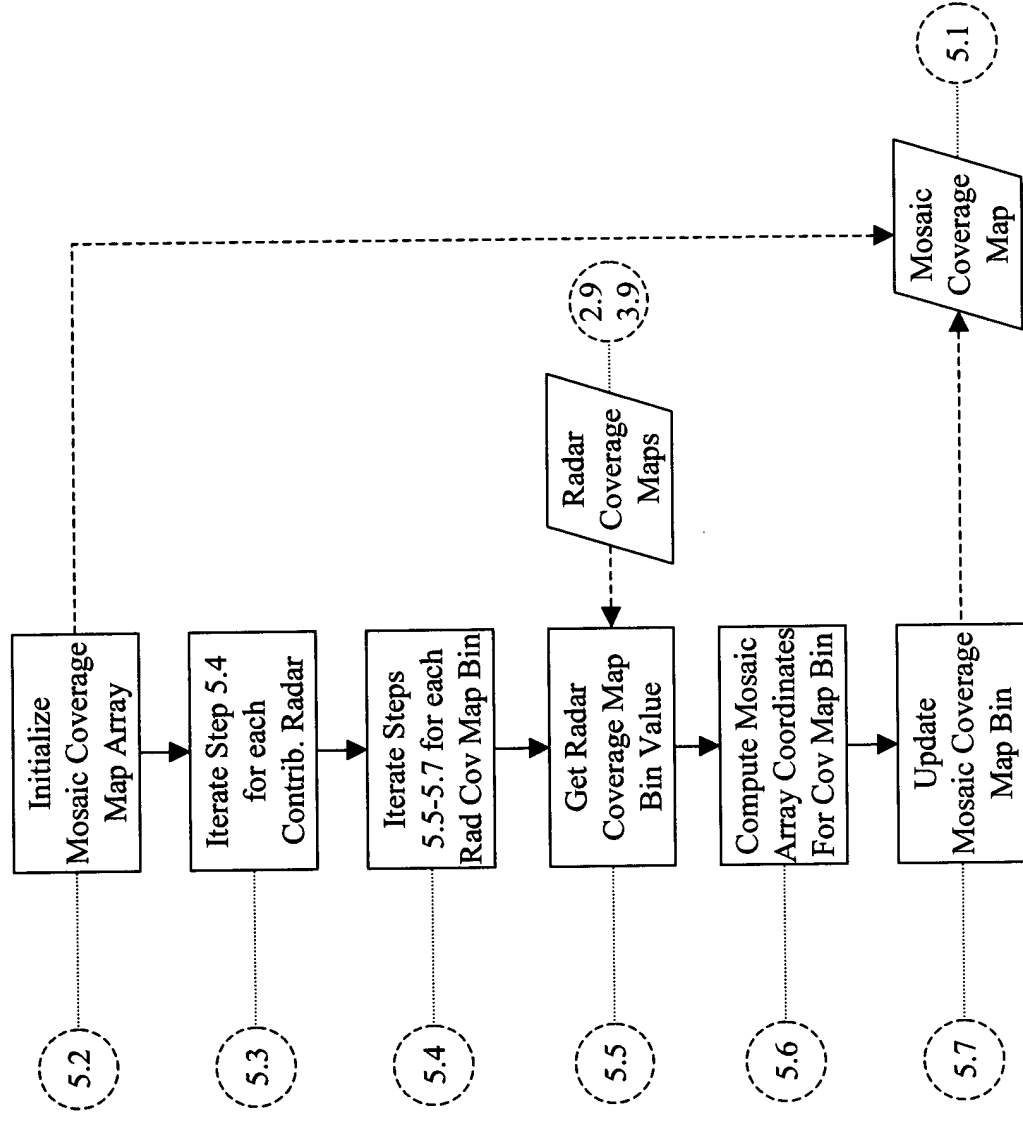Figure 23 – Flow Diagram for Generate Radar
Clutter Region Map Algorithm

Figure 24 – Flow Diagram for Generate Radar Coverage
Map for Radar Mosaic Product Algorithm